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## Becoming Atomic: The Bunker, Modernity and the City

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TITLE PAGE

**Becoming Atomic: The Bunker, Modernity and the City**

*Abstract* (28 words):

This paper seeks to render visible the underground bunker's accelerated production and on-going architectural significance and cultural proliferation during the Cold War under the threat from atomic weapons.

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7100 words

## Becoming Atomic: The Bunker, Modernity and the City

Gary A. Boyd and Denis Linehan

### Underground Gardens and Homes

In 1980, three years before Ronald Reagan launched the Strategic Defensive Initiative (aka Star Wars), Jay Swayze, a former military operative turned builder published a book entitled *Underground Gardens and Homes: The Best of Two Worlds – Above and Below*. As the title suggests the publication set out the case for a new type of architectural domesticity, beneath the ground. Its basic premise – outlined in what the author termed the principles of Geo-building – is that underground living provides security from the actions of both man and nature. Swayze's publication took the form of a catalogue, a kind of apocalyptic pattern book where prospective troglodytes could choose from a range of typologies with special features. Find a site and define a type and Swayze would come and dig a hole for you, line it with reinforced concrete and insert a domestic unit like, as the author describes, 'a ship in a bottle'.<sup>1</sup>

Whatever the implications of an underground interior, it is the notional outside spaces that appear the most problematic. The 'back yard, front yard, patio, courtyard, garden or swimming pool', Swayze iterates, all remain within the shell, all comfortably underground.<sup>2</sup> [1] The solution is obvious, total environmental and visual control. Both outside and inside spaces are illuminated through a combination of artificial lighting and fibre optic cables that convey sunlight from the surface. Following Swayze's assertions on the redundancy of conventional windows, views are conveyed via dial-up dioramas – painted canvases on rollers that can be changed according to mood. Located on the shell wall and visible from either (ersatz) window openings within the domestic unit or else from the 'outside' spaces, these illustrations absolve the underground house from all temporal constraints. It can be winter on the patio, spring in the yard, midnight in the bathroom and mid-afternoon in the kitchen, simultaneously. Architecturally, the house also evokes little of its underground condition. Popular vernacular forms associated with built conventions and climatic conditions on the surface – Texan Ranch houses, regency porches,

verandas, arcades, trellised arches, and hints of pitched roofs – are re-assembled to furnish what Swayze terms the *Underground Dream-world*.<sup>3</sup>

Despite mentioning the growing scarcity of resources that preoccupies our present awareness of the environment, the *Underground Gardens and Homes*' origins lay in the threat of a nuclear holocaust generally, and the Cuban missile crisis in particular. Its prototype, called the *Atomitat* (Atomic Habitat), emerged in 1962 and, according to Swayze, was the first underground house in the US to meet civic defence specifications. A further prototype was exhibited in the World's Fair in New York in 1964 where, again according to Swayze, over 1.6 million visitors queued to experience first-hand the idea of descending into the surface of the earth in order to live. [2] But, as illustrated in the infamous West German government pamphlet *Jeder hat eine Chance* [Everyone has a Chance] (1961), or in the Underground Space Center (in the University of Minnesota), Swayze's underground dream-world, was just one of endless schemes for subterranean survival that proliferated throughout the Cold War.<sup>4</sup>

### **Becoming atomic: infinite preparation**

This essay draws upon recent research that reads the atomic back into histories of post-war architecture and urbanism, to position the bunker at a series of intersections and paradoxes of long duration. Finding a domestic iteration in the Second World War, the bunker became an icon of the Cold War whose antecedents in turn continue to haunt contemporary space. Embodying the tenets of modernism, the bunker is ultimately the antithesis of its bent for utopian, communal progress and instead represents a dark mirror – offering a dystopia of fragmentary isolationist, survivalist entities, linked through invisible electronic networks designed to withstand Armageddon. A space where form strictly follows function – most particularly and evocatively the yield of a nuclear bomb – it is simultaneously dense with meaning. The pervasiveness of the bunker is not limited to the globalised repetition of its physical characteristics and form. The anthropologist Joseph Masco has described the incremental inscription of a bunker mentality on the American psyche from the Cold War onwards: 'the elevation of the bunker into an icon of state power and social responsibility played a critical role in psychologically preparing and orienting Americans for escalating militarism'.<sup>5</sup> The bunker, so central to the Cold War imagination, continues to provide residues in present day conceptions of threat and fear.

Given its scale of production and endless iterations, as well as its development in the pivotal moments of the Second World War, it can be argued that the bunker is as emblematic an architectural space of modernity as the department store, the great exhibition, the skyscraper or the machine-inspired domestic environments advocated by Le Corbusier and others. It offers a concentrated site in which to map how narratives and imaginaries on the city were challenged and remade and speculate upon the legacies that the traumas of the Cold War had upon urban life. In making this proposition we expand Paul Virilio's observation that, once

physically eclipsed in its original topographical and technical settings, the socio-spatial logic of the bunker would mutate into other domains, retaining and remaking their meaning in other forms and practices. 'The essence of the new fortress' he wrote '... is elsewhere, underfoot, invisible from here on in'.<sup>6</sup> To address these speculations, we draw upon David Leatherbarrow's contention that research in urbanism must depart from a reading of the sovereignty of buildings, and attend to their wider contexts, relationships and performances.<sup>7</sup> To amplify these interpretive tools, the essay inspects the imaginations, politics and practices created around the bunker. We do this in order to query the relationships these urban imaginaries had to circuits of power and knowledge, as well as their interface with the city and modernism. We argue also that to give the bunker a place in modernism is to open up a wound in the liberal and progressive histories of urbanism which arguably – until challenged by the likes of Galison (2001), Farish (2010), Light (2004), Monteyne (2011), McEnaney (2000) Rose (2001), Bosma (2012) etc. – diluted or obscured the centrality of war in the foundations of urban life.<sup>8</sup> Of central significance is the concept, expressed by Michel Foucault amongst others, that Western democracies are founded on the appropriation and control of violence. For Foucault, 'Humanity ... does not gradually progress from combat to combat until it arrives where the rule of law replaces warfare' but instead '... installs each of its violences in a system of rules, and thus proceeds from domination to domination'.<sup>9</sup> In this view, war is not an anomaly, the opposite of civilization, but rather it lies at its very origins and continuation. Walter Benjamin's famous dictum that 'There is no document of civilization which is not at the same time a document of barbarism' can, then, be used to map a history of architectural modernism. For Paul Virilio and Sylvère Lotringer, the total war machine built around the project of deterrence during the Cold War enveloped the whole basis and logic of city life. This is what they called the perpetuation of 'Pure War, war which is acted out ... in infinite preparation'.<sup>10</sup>

As the bunker migrates from the military to the domestic sphere during the Second World War and subsequently the Cold War – transforming from 'bomb shelter' to 'fall-out shelter' in the process – the ways in which the social contract is stressed become more precisely identified. Just as Siegfried Kracauer proposed how that other quintessential modern space the hotel lobby is an inverted image of the 'house of god' (the church, the temple, etc.), the bunker shift notions of dissolution even further.<sup>11</sup> If, as Kracauer, noted the house of god provided a community, a directed life, the bunker in spite of the attempts to build it in the spirit of patriotic defence, provided to many in the end the opposite, a space of dread, characterized by 'extreme anomie', an endless endgame.

The history of the bunker, its networks and infrastructures offers a systemic set of insights into the history of the city, or more specifically histories of urbanism. 'Becoming atomic', the intersection of the atomic bomb and the city disrupted the progressive trajectory of modernist urbanism whose core rationale envisioned a future characterized by improvement and innovation. In this context the debate about the bunker became a debate about the relationship between State and

population, and their obligations to one another. These merged into what Farish describes as 'anxious urbanism'.<sup>12</sup> Arguments about the resilience or futility of the bunker, its logic, its utility and so on was contested, diverse and contradictory. The site could variously be a patriotic one, a site where the fallacy of grander nuclear policy was revealed, a site of anxiety and fear, a site of resistance, or of invention and ingenuity. In becoming atomic, these debates on the bomb blended with debates about the city, and inevitably changed the context in which urbanism was conceived.

### **Killing cities**

An examination of the extraordinary visions of urban atomic obliteration reveals the ways in which aerial bombardment came to form the spatial, planning and design response to the collapse of Enlightenment – the conflation of war and urbanism, the intrusion of military planning within the urban planning. But all these narratives represent a similar realisation, the end of a recognisable urban condition. Jacob Viner, one of the founders of the Chicago School of Economics, captured the immediate understanding of the bomb's consequences for the city:

*A single atomic bomb can reduce a city and its population to dust ... The bomb has a minimum size and in this size it is, and will remain, too expensive – or too scarce, whether expensive or not – to be used against minor targets. Its targets, therefore, must be primarily cities, and its military effectiveness must reside primarily in its capacity to destroy urban population and productive facilities. Under atomic bomb warfare, the soldier in the army would be safer than his wife and children in their urban home.*<sup>13</sup>

Albert Einstein observed that '... should one rocket with atomic warhead strike Minneapolis, that city would look exactly like Nagasaki. Rifle bullets kill men, but atomic bombs kill cities'.<sup>14</sup> In the same year, Lewis Mumford saw atomic weapons as a form of madness. He said:

*Truly, those are infernal machines that our elected and appointed madmen are setting. When the machines go off, the cities will explode, one after another, like a string of firecrackers, burning and blasting every vestige of life to a crisp.*<sup>15</sup>

These realisations unsettle the premise of every utopian plan from Patrick Geddes to Ebenezer Howard and occupy the pessimism of Mumford, who dwelt constantly on nuclear obliteration throughout his seminal volume *The City in History*. As is now well documented, these visions of apocalypse drew heavily upon the work of General 'Hap' Arnold, the chief of the US Army Air Forces during the Second World War, whose reports on the bomb to the Secretary of War supplied a devastating vision of the impacts of war from the air. In 'The 36 Hour War' – a graphic rendition of these reports published in *Life* magazine, the nuclear urban future can be seen in all its glory, imagery that has never lost its grip on post-apocalyptic literature and film.<sup>16</sup>[3] These narratives of urban destruction were widespread. In the days after the atom bomb fell on Hiroshima, the potential impacts such an attack would have on various American cities were visualized in numerous newspapers. This moment is crucial as the awe of atomic destruction in Japan was boomeranged back onto on

US soil with the immediate conception of an atomic ground zero at the heart of the American city. [4] Visions of the end of the city proliferated throughout the 1950s. The Military Aspect, Panel II of the Special Studies Project, Rockefeller Brothers' Foundation concluded that an attack on 50 cities would result in 10-15 million dead, 15-20 million injured by blast and heat, 25-35 million fall-out casualties. When asked to comment about this scenario, Willard F. Libby of the United States Atomic Energy Commission, declared in 1958: 'The large cities are gone'.<sup>17</sup> Attempts to critique the position of what the social critic Marcus Raskin called 'The Mega Death Intellectuals', evoked the dead city.<sup>18</sup> In an essay entitled 'The Mushroom Cloud', Virginia Snitow responded to the leak of part of the Deterrence & Survival in the Nuclear Age (Gaither) Report by laying out a vision of the end of the city:<sup>19</sup>

*If New York City were bombed, one could write off the people buried under the rubble. No one could get into the burning ruins of the city for several days. The surrounding areas would be so occupied by their own efforts to keep alive that they could supply little if any assistance. Eventually, highly trained rescue teams might be able to come from distant areas ... With a good part of our nation organized to assist, as in cases of storm and flood, something might be done for survivors fifteen or twenty miles from the blast center. However, New York would be, in case of war, only one of many target cities destroyed. The bombs and missiles would be falling all over the United States at about the same time, with each area an autonomy of chaos.*<sup>20</sup>

In 1961, the science fiction writer Rod Serling wrote a *Twilight Zone* episode called *The Shelter*. The television show depicted sirens ringing over a typical American suburb. The people of the community run to their only neighbour who has built a shelter, but he refuses entry. The result is torment and anarchy. Ultimately, it's a false alarm. But when the calm is restored, while the neighbourhood is materially intact, the community's social bonds are destroyed. This story – which resonates with debates then current – is important in that the bunker reveals not just the material threat to the city itself, but how the bomb challenged the foundational basis of urbanism in social and cultural relations. In this and other scenarios envisioning the end of the city it was not just the destruction of the built environment and the population they represented, but also implicated is the end of the underlying social contract between the citizens, the urban and State. Nuclear war was an existential threat to a whole way of life whose origins lay on the Enlightenment and eviscerated the place of the city in the narrative of human progress: the bomb dismantled the ancient relationship between *urbs* & *civitas* – as defined by St Augustine, the city as an embrace between its built form (*urbs*) and the cultures, practices and emotions that it contains (*civitas*).

### **Urbs and ordnance**

The destruction of the associations between *urbs* and *civitas* are anticipated in the cultural histories of the bunker. Throughout the twentieth century and especially

around the fulcrum of the Second World War, the bunker can be seen to oscillate, through literature, urbanism and architecture and between military, domestic and civic realms, between an imagination of space and a space of the imagination. Given perhaps its ultimate location in the passage between life and death, the representation of the bunker has offered intense reflection on the cultural and physical project of modernity. As a spatial type, bunkers were deeply imbued with these intentions. If a museum or a gallery was intended to offer an illuminated space for public reflection, the bunker was a place for private introspection with enormous public ramifications. Long before the Cold War, the final moment of *Journey's End*, R. C. Sherriff's play – written in 1928 in the aftermath of the First World War – depicts the collapse of a dug-out on the Western Front where a young soldier lies mortally wounded.<sup>21</sup> The scene fulfils the promise of the play's title, a *terminus* where the collapsing of a militarised space into darkness conflates with the eclipsing of a generation. Clearly written in the atomic age a generation later, Samuel Beckett's play *Endgame* (1957) unfolds in what appears to be a similar, if updated, spatial type. Theodor Adorno, writing in an essay titled 'Understanding Endgame,' proposes that the stage directions of 'Bare Interior' 'Grey light' can be thought of as a concrete bunker or perhaps a new-fangled nuclear fallout shelter positioned between desert and sea, somewhere in the present or the near future.<sup>22</sup> Of significance here is that the protagonists are apparently not combatants in a war but are joined by other ties and familial relationships. The setting, complete with dustbins, is as domestic as it is militaristic.

Particular examples from the culture of architectural production – both real and projected – provide symbolic evidence of such juxtapositions across a series of scales from the house to the city. For Jean-Louis Cohen, war served as an 'accelerator of technological innovation and production that would lead to the supremacy of modernism in architecture.' In this he has argued that the Second World War galvanized the connection between urbanists and the military – in particular by deploying many of the functional attributes of modernism into the operational platforms for warfare and later into the fabric of cities.<sup>23</sup> This process inflected the whole urban condition of the Cold War whereby, as Pickering observes: 'What had been largely separate and autonomous institutions before World War II ... had been profoundly transformed and locked together as a complex, social, material, and conceptual cyborg entity by the end of it'.<sup>24</sup>

Citing the *Atomitat* – Jay Swayze's underground incursion into New York's World's Fair (1964) – and Philip Johnson's Glass House at New Canaan, Connecticut (1949), Beatriz Colomina has explored the apparent dichotomy, within postwar modernist architecture, between a tendency to hunker down into the earth and a desire for light-weight transparency.<sup>25</sup> Tom Vanderbilt has described Lever House – the glass skyscraper designed in New York in 1952 by Skidmore Owings and Merrill – as an example of 'fatalistic architecture' an architecture which, when faced with the bomb, both admitted and expressed its own impotence.<sup>26</sup> Yet this arguably represents a departure in the purported functioning of glass architecture between before and



after the Second World War, and even in its designed response to ordnance. As suggested by Cohen and Pickering, the Second World War – preceded by the threat of it – was pivotal in a re-conception of architecture and by extension, its relationship with both the ground plane and vertical and horizontal axes. It is a narrative borne out through a series of particular examples, each of which responds intimately to an ever increasing bomb yield.

Authors such as Paul Overy (2008) have described how an architecture of light, air and openness emerged between the wars.<sup>27</sup> This was predicated on the use of the structural frame which precisely calibrated and resolved loads removing the need for large expanses of dense, load-bearing walls. The development of the curtain wall allowed the dissolution of the threshold, and the intimate connection of private and public space between the domestic or other interior and an increasingly planned and orchestrated landscape beyond. These new spatial relationships – developed in diverse building types such as housing, schools, hospitals, housing, factories, and so on – are perhaps best codified in Le Corbusier's 'Five Points of Architecture' published in 1926: free façade, free plan, strip windows, *pilotis*, roof garden. Together, these elements realise a lightweight architecture of exposure which aspires to be constructed in dry, prefabricated factory-made parts. The roof garden allows an unencumbered relationship with the sky and the elements, the *pilotis* permit the building not only to be sited almost anywhere but also to hover above the ground, touching it only where absolutely necessary.

In 1914, on the eve of the First World War, in a book called *Glasarchitektur* the author and poet Paul Scheerbart expressed an extreme version of the utopian optimism surrounding the possibilities of transparent, framed constructions. For Scheerbart such an architecture, if realised universally, would convey a new form of social democracy and the end of crime through the simple fact that its very transparency would facilitate omnipotent passive surveillance. Equally intriguing, however, is his description of this architecture in the context of the development of new forms of vertical aerial warfare.

*A glass tower when it is supported by more than four metal piers, will not be destroyed by an aerial torpedo; a few iron members will be bent, and a number of glass panels will have holes or cracks, but such damage is simple to repair'.<sup>28</sup>*

The conception of a tall, framed building that is somehow resistant to vertical ordnance was taken up again in 1930 by Le Corbusier in his famous urban proposals for *La Ville Radieuse*. Drawing from his earlier proposal of 'crystal towers soaring higher than any pinnacle of earth' of the *Plan Voisin*, Le Corbusier imagined a series of towers strewn across a bucolic landscape. Precisely serviced with water, gas and electricity, they are simultaneously fortified against *La Guerre Aérienne* by the narrow roof-scape they present to the bomber and against poison gas by virtue of their height.<sup>29</sup>

But such naïve optimism towards the defensive qualities of modernist high-rise glass architecture disintegrated in the Second World War and its prelude. Emblematic of this is the publication produced by the modernist Tecton Architects in

the late 1930s. Entitled *Planned A.R.P.* (Air Raid Protection), commissioned by the Metropolitan Borough of Finsbury, and deploying the talents of Ove Arup under the aegis of Berthold Lubetkin, the book systematically explores the effects of an air war on an urban built environment.<sup>30</sup> It analyses methods of attacks, measures and categorises yield and types of bomb – incendiary, gas, percussion, general purpose, semi-armour piercing – their dispersal and likely effects – impact, shock, penetration, blast, splinters, falling debris, etc. – on architecture and civic space. Against these, measures of protection, from slit trenches to the use of existing basements, surface shelters to deep excavations, are also surveyed and their attributes and qualities explained. The effects of bombing are given a narrative dimension by accompanying drawings by Gordon Cullen. Curiously amusing, these drawings depict devastation in the streets, collapsing basements, exploding buildings, and panicking populations. The solution offered by Tecton were huge, circular shelters, bored into the earth and linking surface to beneath with a helical circulation system that would accommodate the flow of hundreds of civilians in war while in peace-time allow for their use as a car park. After taking in consideration other criteria such as physical contours, population density, the condition of buildings and the disposition of invisibles infrastructures such as water, gas and sewage, Tecton redrew the map of Finsbury to accommodate a network of deep shelters distributed more or less evenly across the borough. Designed as a prototype for a wider national system, the government dismissed the proposal as being potentially detrimental to morale – and promoting a shelter, possibly Communist, mentality.

The architecture of Tecton in the 1930s provides a precise paradigm of the effect and threat of war on the production of architectural form: a unity of opposites and reversals, underground and over-ground – progress and ultimately despair. At the same time as *Planned ARP* was being scripted in 1938, they were completing Highpoint II, their second, slender, white tower block hoisted above the ground on *pilotis* in north London. Their penguin pool at London zoo, meanwhile, prefigures the circulation spaces of Finsbury's deep shelter. In the former, penguins cavort on a double helical ramp suspended in the air fabricated in as thin-as-possible reinforced concrete. In the latter, the ramp system controls and articulates the flow of civilians as they seek shelter from advanced forms of ordnance by efficiently slipping underground. [5, 6]

During the Second World War, modernist architectural luminaries such as Le Corbusier, Jose Luis Sert and Sigfried Giedion considered the future of the city in light of its destruction in Europe. While *Nine Points on Monumentality* (1943) recognized the need for enduring symbolism in architecture perhaps to account for a pervading loss, Sert's *Can our Cities Survive?* (1942) and Le Corbusier's *Le Charte d'Athènes* (1943) propose the continuity of a mechanistic approach, a horizontal separation of functions and the rigorous application of economic and social planning.

<sup>31</sup> For Bosman, the proposal integrated everything:

... contained in the Taylorist/Fordist conception of the beautiful new world: a comprehensively coordinated growth model conducive to the attainment of a balance between the city and the country, the control of urban functions ... in short, the transformation of a previously empirically developed urban conglomeration into an organised, flawlessly hygienic and structurally transparent urban machine.<sup>32</sup>

Promoted by C.I.A.M. (Congrès Internationaux d'Architecture Moderne), *Le Charte d'Athènes* provided the blueprint for post-war reconstruction across Europe. But significantly these texts were written before the destruction of Hiroshima.

While Scheerbart and Le Corbusier's proposals display perhaps a willful ignorance, Tecton's underground proposals are predicated upon a scientific understanding of the increasing yield of conventional weapons. In *Survival Cities*, Vanderbilt observes that defensive architecture is perpetually caught within a race with developing forms of ordnance.<sup>33</sup> For Peter Galison, this quality of form following destructive yield at the scale of architecture and the city has a final iteration in the dispersal strategies proposed for 1950s America.<sup>34</sup> Two further examples from either side of the Second World War provide more evidence of a profound shift yet continuity in thinking. Ludwig Hilbersheimer's *Grosstadt* (1927) epitomizes the Fordist city of total planning and prefigures the C.I.A.M. city as a fully mechanized urban entity predicated on a precise response to perceived functional criteria. [7] In *The Nature of Cities* (1955), he admits the nuclear bomb into this pantheon of bureaucratic and scientific requirements to propose the decentralized city, redolent of Frank Lloyd Wright's Broadacre City (1935), a holistic and integrated landscape of highways, industry and domiciles whose dispersal would ultimately allow survival.<sup>35</sup> [8]

Galison points out dispersal strategies – drawing heavily upon information garnered from the bombing of Germany and models generated from analysis of Hiroshima – were advocated early in the US. The 'Redesign of our country for minimum vulnerability to atomic bomb attack, which means complete dispersal of our cities and moving vital industries under-ground', is the third atomic bomb defence suggested by General Arnold. Early in 1950, the physicist Norbert Wiener drew upon cybernetic methodologies to propose dispersing settlement across the landscape. Citing the low-density occupation of the Soviet Union as being less likely to succumb to utter Atomic devastation, Wiener's proposal becomes another paradigm for a series of models of networked suburbanisation and infrastructural development. For Wiener, however, civil defence provision also contained the possibility of a redistribution of wealth, part of 'a positive program of social and economic action directed at the elimination of poverty and social injustice which are the source of Communist power'.<sup>36</sup>

While propositions for dispersal were influential and did effect some substantial interventions in the American landscape – most notably the interstate highway system under the presidency of Eisenhower – such strategies were ultimately undone by both economics and ideology. The yield of hydrogen bombs was such that resistance, if ever possible, would have required a holistic, integrated,

planned, totalising urban system. Mass, designed survival at the scale of the city contained one last evident paradox – and this was evident not only within dispersal strategies but also elsewhere in other grand schemes like Oscar Newman's proposal for a subterranean, nuclear-proof Manhattan (1969) – that survival would require levels of State control, organisation and intervention normally associated with the Communist bloc. The cost of survival would be the price of freedom. [9]

### **Becoming atomic: fragmentation and myth**

The process of cities becoming atomic was diverse, often contested and changed over time. It was, moreover, fragmentary and as reliant on the production of information, myth and representations of space as it was on the production of space itself. In 1962, \$38 million was released by Congress to survey the built environment of the USA and evaluate its potential to both survive and offer shelter. The American Institute of Architects collaborated with the Office of Civil Defense using both architects and architectural students to complete this task. There are of interest because they seem to promote survival at the level of the individual building. Architecture and a modernist pallet continue to be called upon to defend and protect but in precise, isolated interventions into the built environment rather than holistic definitions of new urban complexes. Projects exhibited at the Rice University Conference on Industrial Buildings (1963) proposed a strategy of sinking buildings half-way into the ground. Thus, the basement lunchroom could double as a fallout shelter while upstairs the rest of the building would address the building environment in a more conventional manner. Similarly, the Grand Prize of the National School Fallout Shelter Design Competition (1963) was awarded to Ellery C. Green, an architect working in Tucson Arizona. He was praised by the jury for providing a shelter in a school which presented no interference or conflict with the normal functioning of the building, noting that in fact 'it is not readily apparent that [it] was designed as a shelter ... The light airy feel achieved in this essentially below ground facility is a significant advantage in shelter habitability'.<sup>37</sup> Here, the subterranean is deployed in a range of spaces designed to allow continuities of life following nuclear fallout and to reconcile modernist prerequisites for light and air with a terrain of blast proof doors and thickened reinforced concrete reminiscent of the Maginot Line beneath. [10, 11]

In her essay, 'Architects of Armageddon', Melissa Smith explores the gaps in information between banal advice on continuing everyday life during nuclear war contained in a British governmental pamphlet from 1959 – including the best way of using washing machines and vacuum cleaners to dispose of radioactive material – and a highly secret report written two years earlier for the same government envisioning utter devastation under the same conditions.<sup>38</sup> For Mark Duffield:

*official thinking began to focus on the continuity of government and vital systems while leaving the public's survival, apart from palliative rehearsal and educational measures, to luck and self reliance. In the UK, this shift was marked in 1972 by a name change from Civil to Home Defence.*<sup>39</sup>

Sarah A. Lichtman has explored the phenomenon of at-home bunker making in the 1950s and 1960s USA suggesting that not only was this somehow more consistent with the American 'traits of enterprise and independence' but also that these initiatives (echoing Masco above) ultimately 'permeated America's post-war consciousness more than its physical landscape'.<sup>40</sup> The volume of advice manuals published internationally concerning nuclear survival at home is impressive, as are the titles that evocatively express juxtapositions between domestic or otherwise ordinary space, and catastrophe. The following list is by no means comprehensive: *Shelter from Atomic Attack in Existing Building: Part I Methods for Determining Shelter Needs and Shelter Areas* (Federal Civil Defence Administration, 1952); *The Family Fallout Shelter* (Executive Office of the President 1959); *Clay Masonry Family Fallout Shelter* (Office of Civil and Defense Mobilization, 1960); *Fallout Protection: What to know and Do about Nuclear Attack* (Department of Defence, Office of Civil Defence, 1961); *The Behaviour of Radioactive Fallout in Soils and Plants* (National Academy of Sciences – National Research Council, 1963); *Advising the Householder on Protection Against Nuclear Attack* (HMSO, 1963); *Fallout Protection for Homes with Basements* (Department of Defence, Office of Civil Defence, 1966); *Expedience Shelter Construction and Occupancy Experiments* (Cresson H. Kearney, Oak Ridge Laboratory, TE, 1976); *Home Fallout Shelter Snack Bar plan d – basement location Fallout Shelter* (Federal Emergency Management Agency (FEMA), 1980) (Fig 8); *Domestic Nuclear Shelter: Advice on Domestic Shelter providing protection against nuclear explosion* (UK, 1980s). *Jeder hat eine Chance* [Everyone has a Chance] (1961) (cited above) provides an example from outside the UK/US axis. Despite spanning decades, faced with a universal threat of nuclear blast and fallout these publications offer a consistent series of prescriptions, specifications for new building or retro-fitting and lists of equipment and advice on what to store and how to behave. Many contain architectural drawings, others combine these with cartoon scenarios of survival either drawn or in photograph. Some provide diagrams of the yield and effect of nuclear explosion. *Jeder hat eine Chance* depicts individuals caught out in the open by the blast and suggests possible actions: occupying a ditch, lying on the ground near some steps with a bag over your head, sitting underneath a table in an echo of the US's infamous 'duck and cover' drills.<sup>41</sup> [12] Others evoke domestic continuities, women cooking, people serving drinks, families at rest and at play, or else making the shelter in the first place, generally by digging. In the domestication of nuclear survival portrayed by these publications there is, however, no community. Instead, there is just piece by piece fragments of individualised, isolated survival. As hinted by Jay Swayze's proposal, in the domestic shelter and the descent into the ground there is no longer any urban.

### **Bunker Resistances**

In 1959, the New York planner Walter Thabit stood out by arguing to his colleagues that 'The fallout shelter program serves only to lull the nation into a false sense of security. The planning profession, therefore, should disassociate itself from this

program and should advocate a productive political solution as the only protective measure that will save our cities'.<sup>42</sup> These are issues well covered in Cold War social history, notably, Dee Garrison's *Bracing for Armageddon* (2006), which reveals the popular opposition toward civil defense drills and public rehearsals, and Laura McEnaney's *Civil Defense Begins at Home* (2000) which unravels the discomfort many felt dealing with the ramifications of militarization of family life under civil defense regulations.<sup>43</sup> This scholarship underlines how state investment in the bunker as the site in which both city and population would survive, inevitably made it a site of disquiet both in the USA and internationally. Imposing the bunker into the urban sphere was destabilising. It linked daily life unwillingly to Cold War conflict, embedding the battlefield into the domestic in a way that could be relentless and disturbing in its effects.<sup>44</sup> It generated a complex fear, based on blast, insecure sequestration underground, uncertain future, possible post-war anarchy and cruel disease from nuclear fallout. In this process, the State became riddled with contradictions, being at once the provider of security and part of the reason through which security itself would be destroyed. In 1948, the Emergency Committee of Atomic Scientists, of which Albert Einstein was president, presented six statements about the reality of nuclear war to the public. No. 5 concerns bunkers: 'Preparedness against atomic war is futile, and if attempted will ruin the structure of our social order'.<sup>45</sup> This observation was prescient. In her work on civil defence training in the American school system, the historian Jo Anne Brown has captured the stresses such kinds of preparation involved. Faced with the prospect of nuclear attack, the National Parent-Teachers Association (PTA) instructed teachers to set their own 'emotional houses in order' and then help children to do so'. She notes that for the PTA '... the future mental health of an entire generation depended upon parents' and teachers' abilities to 'maintain calmness and transmit a feeling of assuredness'. Children must be taught to 'meet squarely' the 'emergencies they might face, including atomic bombardment'.<sup>46</sup> These emotional strains upon civic and personal life were not uncommon. Writing in the *Scientific American*, the peace activist Arthur Waskow reported how 'the civil defence effort has strained the web of community' as surveys concluded that individuals – like the *Twilight Zone* episode – were prepared to exclude 'neighbours, or people from the next block, or strangers from the next county, or casual visitors to town, from the family or community shelter'. These strains they concluded would only be exacerbated as '... cities realise how vulnerable they are to attack, as racial and ethnic groups compete for space in and access to community shelters'.<sup>47</sup>

No amount of propaganda could evade the realization that atomic war would lead to what Derrida saw as '... a total and remainderless destruction of the archive'.<sup>48</sup> The archive in this case was the social relations that held a city together. Citizens were obliged to resolve – if they could – dissonant feelings as they lived in what Masco describes as '... a new psycho-social space between the utopian promise of American techno-science and the minute-to-minute threat of thermonuclear incineration'.<sup>49</sup> It meant that many experienced the contradictions of what Bacon Hales describes as

the '... paradigmatic Cold War cultural landscape, simultaneously a huddling place and open community, with neither extreme particularly far from the other'.<sup>50</sup> As the geographer Robert E. Dickinson put it, in his review of Mumford's *The City in History* '... in our contemporary megalopolitan civilization, necropolis is near'.<sup>51</sup>

Protest, cynicism and satirical responses were commonplace. In the UK, the pamphlet *Advising the Householder on Protection against Nuclear Attack* published in 1963 was widely mocked while, in New York around the same time, Sally Baldwin, writing in the satirical magazine *The Realist* observed how:

*Creating an adequate fallout shelter program is all well and good, and it will be a comfort to many to know that their families are being protected. Anybody can see however, that this plan has a major fallacy: when the Button is pushed, you are apt to be in Canarsie on business, while your cosy shelter sits out in Mastic Acres, Long Island.*

Hence she proposed a 'Bomb Shelter Key Club Plan', where like minded individuals – such as jazz enthusiasts and bridge players – could club together to make like-minded shelters, to avoid the distressing prospect of spending the last weeks of your life with 'mothers with squealing brats; matronly school teachers in town sightseeing from God's Shank; and the little man who normally sold shoddy hats with long plumes and the name 'Spunky' stitched thereon in Times Square'.<sup>52</sup> But perhaps the most acute critique came from the *Situationist International*. Observing the construction in French cities of rent controlled housing (*Habitation à Loyer Modéré*), and the provision of bunkers beneath them, they argued:

*[the] concentration-camp organization of the surface of the earth is the normal state of the present society in formation; its condensed subterranean version merely represents that society's pathological excess. This subterranean sickness reveals the real nature of the 'health' at the surface.*

For them, the logos of infinite preparation and the real purpose of the shelter 'is to test – and thereby reinforce – people's submissiveness and to manipulate this submissiveness to the advantage of the ruling society'.<sup>53</sup>

## Conclusion

Duffield's identification of 1972 as the pivotal moment between the suggestion of governmental provision of mass, civil shelter to a limited strategic response and the onus on the population to provide their own, is an interesting one. Marking the end of the post-war economic boom and the Bretton-Woods agreement which tied the US and other currencies to the gold standard, 1972 is often cited as the end of an economic and social epoch. In architecture, the destruction of the Le Corbusier-inspired narrow, tall, vertical blocks at Pruitt-Igoe in the same year was famously hailed by Charles Jencks as the 'end of modernism'.<sup>54</sup> In his essay 'War Against the Centre', Peter Galison proposes that a post-modernistic conception and re-ordering of space can be identified as emerging from the distributed strategies deployed by the Nazi administration in the final years of the Second World War. Its redeployment in the US, in proposals and partially executed projects for dispersal

from the 1950s onwards, 'The modernist trope of concentration became postmodernist dispersal, cohesion shifted to fragmentation, and metropolis to counter-urbanisation' – ultimately leading to intense urban sprawl.<sup>55</sup>

It is tempting to also see the postmodern in Jay Swayze and others' proposals for underground living. Here, in a parodic iteration of the aspirations of the modernist villa, and using the ground as a fulcrum, thresholds between inside and outside are thickened rather than diminished and connections to landscape and views replaced by dial-up panoramas, free-floating signifiers for an imagined, nostalgic and unconnected reality. But as David Harvey and others point out, in the transition between modernism and post-modernism there are acts of continuity as well as cessation.<sup>56</sup> In Weimar Germany, the architect Bruno Taut and others established the idea of a *wohnkultur* a new way of living which, through the intercession of architectural space embodying technology and extending to urban organisation, would realise a new type of character and psychology in the individual, leading to the production of a new type of progressive society. Despite the contestations and criticisms of the bunker that emerge throughout its Cold War recirculation from the military to the domestic, for Lichtman, Masco and others the bunker has provided an equally pervasive and operative cultural legacy not in the interest of communal progress but of individual survival and an on-going perpetuation of terror. The bunker, with its tight functionalist alignment of form following ordnance, has not necessarily compelled people to underground lives but rather the idea of it has been instrumental in inculcating an underground mentality. [13] From this perspective, the bunker is simultaneously both the apotheosis and antithesis of modernity. It speaks of a terminal architecture where human social and personal is directly affected by spatial circumstances but where an architecture of putative progress is overtaken by an architecture of stasis.

For there is no progress after annihilation, and no capacity, revolutionary or otherwise, for the fall-out shelter to build a better world, as envisioned for other architectural interventions within modernist culture and politics. The shelter was to all extents a cave or a tomb. If, for Paul Virilio, the Atlantic War represented a monument to the advent of total war then Jay Swayze's *Underground Gardens and Homes* project can be seen as totemic of its perpetuation. In this regard, the bunker suggests continuation without development, the end of modernism, history, and the Enlightenment project. Paradoxically, one of the functions the bunker served is to make these relationships explicit and accordingly, it becomes a lightning-rod for critique and counter-culture. The bunker's position within a dialectic of modernity that moves forward and back across time allows the apparent distance between it and other forms of architecture to be recast as relationships of proximity. This is a discordant space, a conditionality that inflected its meaning during the Cold War and continues in the bunker's afterlife, shaping its interpretation as ruin, archaeology, and art. It is this spatial dissonance, internal contradiction and cultural instability which holds so much fascination. The space cannot be contained underground but rather, in both in its genealogy as an urban artefact and its form



and intent as a means to manage insecurity – though any number of exclusionary urban practices reflected in green-zones, securitization and gated urban communities – its influences are widely manifested.

## Notes

<sup>1</sup> Jay Swayze, *Underground Gardens and Homes: The Best of Two Worlds – Above and Below* (Texas: Geobuilding Systems, 1980), p. 21.

<sup>2</sup> *Ibid.* p. 83.

<sup>3</sup> *Ibid.* p. 31.

<sup>4</sup> *Jeder Hat Eine Chance* (Bad Godesberg: Bundesdienststelle für zivilen Bevölkerungsschutz [Federal Civil Service Office], 1961); Donna Ahrens, *Earth-Sheltered Homes: Plans and Designs* (Minnesota: Underground Space Center, University of Minnesota, 1981).

<sup>5</sup> Joseph Masco, 'Life Underground: Building A Bunker Society', *Anthropology Now* 1 (2) (Oxford: Taylor and Francis, 2009) pp. 13-29.

<sup>6</sup> Paul Virilio, *Bunker Archaeology* (New York, NY: Princeton Architectural Press, 1997) p. 46.

<sup>7</sup> David Leatherbarrow, *Architecture Oriented Otherwise* (New York: Princeton Architectural Press, 2009).

<sup>8</sup> Peter Galison, 'War against the Center', *Grey Room* 4 (Cambridge, Mass.: MIT Press, 2001) pp 5-33; Mathew Farish, *The Contours of America's Cold War* (Minneapolis: University of Minnesota Press 2010); Jennifer S. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America* (Baltimore: John Hopkins Press, 2004); David Monteyne, 'Shelter From The Elements: Architecture and Civil Defense in the Early Cold War', (New Essays on Ethics and Architecture) *The Philosophical Forum* 35 (2) (London: Wiley-Blackwell 2004); Laura McEnaney, *Civil Defense Begins at Home: Militarization Meets Everyday Life in the Fifties*, (New York, NY: Princeton University Press, 2000); Kenneth Rose, *One Nation Underground: The Fallout Shelter in American Culture* (New York: New York University Press: 2001); Koos Bosma, *Shelter City: Protecting Citizens against Air Raids*, (Amsterdam: University of Amsterdam Press, 2012).

<sup>9</sup> Michel Foucault, 'Nietzsche Genealogy, History' in *Michel Foucault Aesthetics Essential Works of Foucault 1954–1984*, Vol. 2, edited by James D. Faubion (London: Penguin Books, 1994) p. 378.

<sup>10</sup> Paul Virilio and Sylvère Lotringer, *Pure War* (Cambridge, Mass.: Semiotext(e)/MIT Press 1997/2008) p. 92;

<sup>11</sup> Siegfried Kracauer, 'The Hotel Lobby', *The Mass Ornament: Weimar Essays* (Cambridge, Mass.: Harvard University Press, 1995).

<sup>12</sup> Matthew Farish, 'Another Anxious Urbanism: Simulating Defense and Disaster in Cold War America', *Cities, War and Terrorism: Towards an Urban Geopolitics* (edited by Stephen Graham) (London: Blackwell, 2004).

<sup>13</sup> Jacob Viner, 'The Implications of the Atomic Bomb for International Relations', *Proceedings of the American Philosophical Society* 90 no. 1, (Jan. 1946) pp 53-58.

<sup>14</sup> Cited in M. Armine, 'The Real Problem is in the heart of man', *New York Times Magazine* June 23, 1946.

<sup>15</sup> Lewis Mumford, 'Gentlemen You are Mad', *The Saturday Review of Literature* March 2 (1946) pp 5-6.

<sup>16</sup> *Life Magazine*, 'The 36 Hour War: Arnold report hints at the catastrophe of the next great conflict', vol. 19, no. 21 (November 19, 1945).

<sup>17</sup> Willard F. Libby, *Bulletin of Atomic Scientists*, 14 no. 5 (May 1958), p. 191.

<sup>18</sup> Marcus G. Raskin, 'The Megadeath Intellectuals' *New York Times Magazine* (November 14, 1963).

<sup>19</sup> Security Resources Panel of the Scientific Advisory Committee, Deterrence & Survival in the Nuclear Age (Gaither) Report (November 1957).

<sup>20</sup> Virginia Snitow, 'The Mushroom Cloud', *The Western Political Quarterly* 11 no. 4 (Dec., 1958), pp 875-885.

<sup>21</sup> Robert Cedric Sherriff, *Journey's End* (London: Penguin, 2000).

<sup>22</sup> Samuel Beckett, *Endgame* (New York: Faber and Faber, 2009); Theodore Adorno and Michael T. Jones, 'Trying to Understand Endgame,' *New German Critique* No. 26, Critical Theory and Modernity (Spring – Summer, 1982) pp 119-150.

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<sup>24</sup> Andrew Pickering, 'Concepts and the mangle of practice: constructing quaternions', *South Atlantic Quarterly* 4 no. 2 (1995) p. 17

<sup>25</sup> Beatrice Colomina, *Domesticity at War* (Cambridge, Mass.: MIT Press, 2007).

<sup>26</sup> Tom Vanderbilt, *Survival City: Adventures among the Ruins of Atomic America* (Chicago: University of Chicago Press, 2002) p. 75.

<sup>27</sup> Paul Overy, *Light Air and Openness: Modern Architecture Between the Wars* (London: Thames and Hudson, 2008)

<sup>28</sup> Paul Scheerbart, *Glass Architecture*, trans. by James Palmes, edited by Dennis Sharp (New York, NY: Praeger (1972 (first published in German in 1914)) p. 61.

<sup>29</sup> Le Corbusier, *The Radiant City: Elements of a Doctrine of Urbanism to be Used as the Basis of our Machine-Age Civilization* (New York, NY: Orion 1967 (first published in French 1933)).

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- <sup>31</sup> José Luis Sert, Fernand Léger, Sigfried Giedion, 'Nine Points on Monumentality' *Architecture Culture 1943-1968: A Documentary Anthology*, edited Joan Ockman, (New York, NY: Colombia Books of Architecture, 1993) pp 27-31; José Luis Sert, *Can Our Cities Survive? An ABC of urban problems, their analysis, their solutions based on the proposals formulated by the C.I.A.M.* (Cambridge Massachusetts/London: Harvard, 1942); Le Corbusier, *The Athens Charter* (New York, NY: Grossman 1973 (first published in French as *Le Charte d'Athènes* 1943)).
- <sup>32</sup> Jos Bosman, 'Editorial: functional city?', *Werk, Bauen und Wohnen* 4 (1993) pp 6-7.
- <sup>33</sup> Vanderbilt, *op cit*.
- <sup>34</sup> Galison, *op cit*
- <sup>35</sup> Ludwig Hilberseimer, *Metropolis-architecture*, edited by Richard Anderson, (New York: NY: Columbia Books on Architecture and the City, 2014 (originally published as *Grosstadtarchitektur* in 1927)); Ludwig Hilberseimer, *The Nature of Cities: Origin, Growth and Decline; Pattern, Form; Planning Problems* (Chicago: Paul Theobald, 1955).
- <sup>36</sup> Robert Kargon and Arthur Molella, A. 'The city as communications net: Norbert Wiener, the atomic bomb, and urban dispersal', *Technology and Culture* 45 no. 4 (2004) p. 770.
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- <sup>38</sup> Melissa Smith, 'Architects of Armageddon: the Home Office Scientific Advisers' Branch and Civil Defence in Britain, 1945-68', *British Journal for the History of Science* 43 no. 2 (2010) pp 149-180.
- <sup>39</sup> Mark Duffield, 'Environmental Terror: Uncertainty, Resilience and the Bunker', School of Sociology, Politics and International Studies, University of Bristol. Working Paper No. 06-11. 20 (<http://www.bristol.ac.uk/media-library/sites/spais/migrated/documents/duffield-0611.pdf> Accessed 25 February 2017) p. 20.
- <sup>40</sup> Sarah A. Lichtman, 'Do-It-Yourself Security: Safety, Gender, the Home Fallout Shelter in Cold War America', *Journal of Design History* 19 no. 1 (2006) p. 39.
- <sup>41</sup> *Jeder Hat ein Chance op cit* pp 16-17.
- <sup>42</sup> Walter Thabit 'Planning and Civil Defense', *Journal of the American Institute of Planners* 25 no. 1 (1959) pp 35-40.
- <sup>43</sup> Dee Garrison *Bracing for Armageddon: Why Civil Defense Never Worked* (Oxford: Oxford University Press, 2006) and McEnaney *op cit*.
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- <sup>47</sup> Arthur I. Waskow, 'The Shelter Centered Society', *Scientific American* May 1 206, 5, (1965) p. 47.
- <sup>48</sup> Jacques Derrida, 'No Apocalypse, Not Now (Full Speed Ahead, Seven Missiles, Seven Missives)' *Diacritics* 14 no. 2 (1984) p. 20.
- <sup>49</sup> Masco p. 54.
- <sup>50</sup> Peter Bacon Hales, *Outside the Gates of Eden: The Dream of America from Hiroshima to Now* (University of Chicago Press 2014), p. 109.
- <sup>51</sup> R. E. Dickinson, 'The City in History', *Annals of the Association of American Geographers* 52 no. 3 (1962) pp 300-306.
- <sup>52</sup> Sally Baldwin, 'Bomb Shelter Key Club Plan', *The Realist*, 39 (1961) p. 1.
- <sup>53</sup> *Situationist International*, Geopolitique de l'Hibernation, *Internationale Situationniste* 7 (1962) p. 6.
- <sup>54</sup> Charles Jencks, *The Language of Post Modern Architecture* (New York: Rizzoli, 1977). The problems and ultimate demise of part of Pruitt-Igoe were documented in both film and text by Oscar Newman. His book *Defensible Space* (1972) provides an interesting counterpoint to his project for a secure New York by placing it underground.
- <sup>55</sup> Galison *op cit*. p. 7.
- <sup>56</sup> David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (London: Wiley, 1992).

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